FOR MYSORE STATE

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Food (1949) Department.

Ms. SERIES.

G.O. No. 736

Dated 11th August 1949

[Despatch Abstract.]

AGRICULTURE - Indian Council of Agricultural Research - Scheme for the establishment of Central and Regional Jee Research stations in Madras Province - Forwarded.

GOVERNMENT OF MADRAS
Food Department

Letter Ms.No.735 dated 11.8.49.

~~From~~

To

The Secretary to the
Indian Council of Agricultural Research,
NEW DELHI (with enclosure).

Dated Fort St. George the 11th August 1949

Sir,

Sub: Agriculture - Indian Council of Agricultural Research - Scheme for the establishment of Central and Regional Bee Research Stations in Madras Province - Forwarded.

Ref: Your letter No.F8(6)/47-A.H., dated 2-5-1949

...

I am directed to forward herewith a revised scheme for the establishment of a "Central and two Regional Bee Research Stations in this Province deleting the propaganda portion. The scheme is estimated to cost Rs.4,900/- non-recurring and Rs.99,170/- recurring for five years. It is proposed to share the recurring expenditure equally between the Indian Council of Agricultural Research and the Provincial Government and the non-recurring expenditure will be met entirely by this Government.

2. I am to request that the sanction of the Indian Council of Agricultural Research to the scheme may kindly be obtained and communicated to this Government.

Yours faithfully,

** **

Copy to the Director of Agriculture,

He is requested to submit the usual printed copies of the scheme at a very early date for forwarding to the Indian Council of Agricultural Research (with a ~~copy of pp.9-22 of.~~ enclosure).

(True copy)

Superintendent,
Madras Record Office.

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Indian Council of Agricultural Research
SCHEME FOR THE ESTABLISHMENT OF REGIONAL BEE-RESEARCH STATIONS.

1. Introduction- Honey has been in use in India both as a food as well as a medicine from the very early days and the needs of the country have been met mostly from the local supplies only, but it is also reported that considerable quantities of honey and wax of late being imported. The main local source of the bulk quantities has been the rock bee (Apis dorsata). The crude and unclean methods of extraction of the honey, its improper preservation and sometimes the deliberate adulteration are too well known to deserve any special mention here. Improved methods of bee-keeping were planned and attempted in India about four decades ago by one or two amateurs as well as by the then Imperial Entomologist, Pusa. The habits of the indigenous species of honey-bees were investigated and it was found that only the Indian bee (Apis Indica F) was suitable for domestication. A few colonies of the European bee also (Apis mellifica F) appear to have been tried without any appreciable degree of success. In South India, the Jesuit Fathers at Tiruchirapalli were the pioneers in the trials with the Indian bee and some encouraging results have been recorded by them by 1916. Except for enthusiasm of these amateurs, little or no interest was evinced by the public till the phenominal depression days of 1930. Rural uplift, improving the standard of living and finding out ways and means of providing sufficient occupation for the ryot during the off-season, etc., were the main cry of the day. Bee-keeping was considered to be one of the profitable cottage industries. Govt. agencies as well as a few missionary and philanthropic organisations evinced an extraordinary zeal in giving a fillip towards the popularizing of this industry. The efforts were not in vain. The response from the public were very encouraging and remarkable, strides were made in its spread - there being over 10,000 hives in this Presidency, maintained by mostly private enthusiasts. By about 1940 with the outbreak of second world war, there was a deterioration in the progress, probably due to the want of spoon-feeding by the organizing agencies and partly to the high prices of agricultural produce and other easier methods of making money. With all this, the demand for pure honey has been on the increase and sometimes even fancy prices up to Rs.5/- per pound were offered.

II. Need for research.- Now with the return of normal conditions and attainment of the long-cherished independence of the country, our motto should be to keep pace with the other countries in all lines of development. It is needless to add here that bee-keeping is one of the main Agro-industries of the western countries and remarkable progress has been made in this direction. India is a country with unlimited agricultural and forest wealth and as such there is always a bountiful supply of bee-pasturage. The work of the previous two decades on the Indian bee has helped us to gauge its potentialities, limitations and under the existing conditions and the future line of work would, therefore, lie in the augmentation of the present knowledge with the help of the up-to-date methods of breeding and hybridization, with better varieties, a more intensive study of the habits of the bee, improvement of the bee appliances, study of the pasturage places, etc. Too much stress on the urgent need for further research is hardly necessary here, as the following few aspects would indicate:-

(1) The public are fast realizing the medicinal and food value of honey and the demand for the genuine stuff is on the increase.

(2) The country is not self-sufficient in the supply of this material in spite of the existence of the unlimited natural resources.

(3) There is enough evidence to show that we have still to depend upon foreign countries even for this material.

(4) Past work indicates a bright future for the industry on account of the unlimited natural resources already existing in the country.

(5) The industry would provide an ideal and profitable side line to the ryot and thus augment the scanty income from agriculture.

(6) The direct benefit which may accrue and go to enrich the country's resources by means of cross-pollination by bees is invaluable.

(7) Quantities of pollen and nectar present in the flowers of most trees and plants are at present going to waste and bees are the only agents which are capable of collecting these materials and make them available for man's use.

III. Work done.- A considerable amount of spade work has already been done on Apis Indica at Coimbatore. The knowledge and experience on hand is quite adequate to run an apiary of this bee successfully and a short resume of the salient features of the results obtained is given below:-

A. Reearch - (a) General habits of bees.-(1) Breeding and swarming seasons, (2) life history of the three different members, (3) their longevity, (4) egg-laying capacity of the queen, (5) range of flight, (6) response of the bees to the weather and (7) individual pollen-bearing capacity, etc.

(b) Management.- (1) Hiving technique, (2) building up the strength of colonies, (3) swarming and its control, (4) dividing, (5) uniting, (6) queen rearing and (7) queen introduction, etc.

(c) Pasturage.-A fairly exhaustive list of the nectar and pollen yielding flora of this Presidency with details regarding the months of flowering, status, as bee-pasturage crops, time of visit by the bees, etc., has been compiled.

(d) Enemies.- The important bee enemies of this Presidency have been studied. The most destructive of these is the wax-moth - Galleria mellonella. Efficient, cheap and simple control methods have been evolved and are being advocated.

(e) Appliances.- Suitable appliances such as honey extractors, drone and queen traps, queen excluders, bee-escapes, comb foundation sheets, etc. were either devised or adapted and these are exceedingly popular with the public.

(f) Honey.- (1) Chemical analysis of a few samples were made. Methods of proper ripening, storage, artificial granulation, etc. were adopted.

(2) Enormous quantities of honey are collected from the forests from the combs of the rock bee (Apis dorsata). The methods of extraction and preservation were rather crude with the result the honey deteriorated in quality during storage. The problem was worked out thoroughly. Appliances for the hygenic extraction and methods of ripening and proper preservation of honey were devised. These methods are reported to be successfully practised in one or two centres of the Forest department.

B. Propaganda.- The industry is being popularized by the issue and distribution of comprehensive publications priced as well as free in English and in the different vernaculars. Arrangements are made for the supply of appliances at moderate rates. Training is given in the subject to interested parties. Exhibits regarding bee-keeping always form an attractive feature in most of the exhibitions and fairs.

With this back-ground of fundamental work at our credit, it is quite opportune that proposals for a further intensive study of the subject are on the move. A gist of the proposed items of work is given below. If the scheme is sanctioned and worked for the time stipulated, I feel that almost the last word can be said on the subject by about the termination of the period.

IV. Future work.- The proposed lines of research are enumerated below:-

A.(1) The Indian bee.- Apis Indica - Classification.- The only two distinct varieties of Apis Indica F that occur in South India are the plains and hill varieties. Specimens of these two categories were sent to the Imperial Bureau of Entomology

some time back and both of them were identified as Apis Indica F. On this authority, the two varieties may be described only as two biological races. The apparent distinguishing features between the two are that the hill bees and their queen are darker in colour and slightly bigger in size in their natural habitat. From the preliminary trials made at Coimbatore the bigger size and the darker colour of the workers appear to mellow down to those of the plains bees in the course of one or two years, while the dark colour of the queen alone persist. The change in the colour and the size of the workers may be due to the exposure to the local weather conditions and in the case of the queen, the persistence of her colour may be due to her remaining indoors all her lifetime. There are a few other points of difference in their habits, temper, foraging and breeding capacities, etc., but these factors may not afford sufficient scientific evidence to warrant their classification even into different varieties or strains. A more reliable index would be the study of the biometric characters regarding the tongue length, leg length, sizes of wings and the cubital cells, their brood cells, etc. Bees from different localities of the plains as well as the hills may be collected and studied for these details. Attempts may also be made to correlate these factors with the working capacity of the bees.

(2) Breeding and selection.- Colonies with desirable traits like mild temper, non-swarming propensity, good honey gathering capacity, etc., can be isolated and bred for desirable qualities. This work will be continued both with the hill and plains bees.

(3) Acclamatization of the hill bees on the plains.- These bees are better breeders and honey-gatherers in their natural haunts, which may probably be due to the more favourable local climatic and pasturage conditions. Trials will be made to transport a few colonies of these bees and study their behaviour on the plains.

(4) Swarming and its control.- This has been and still is a real hindrance even in Western countries where bee-keeping has been perfected as a fine art. Some palliative methods have been devised and found fairly effective. The Indian bee is notorious for its swarming propensities and until and unless definite methods to curb this undesirable instinct are devised, domestication of the Indian bee cannot be said to be perfect.

B. The foreign bee.- (1) Apis Mellifica: The bee is reputed to give phenomenal honey yields in the temperate regions. A number of attempts have been made to import this species and acclamatize it in India for the past three or four decades and no case of any success is on record so far. I am personally somewhat sceptic regarding their satisfactorily progress under Indian conditions, but the trials are worth taking up in view of the enormous possibilities in case the attempts prove to be successful. Care should, however, be taken to import colonies free from infectious diseases and only from places having similar climatic and pasturage conditions as those of South India. America and Australia will be the source to be tried. The behaviour of the colonies may be observed both on the hills as well as on the plains. A very careful eye will be kept on their progress and causes for their success or failure in this country worked out.

(2) Besides, the European bee, the indigenous honey bee of Egypt - Apis fasiata - is also said to be a very good honey gatherer. If possible, a few colonies of these also will be imported and tried, since the climatic and weather conditions of this country may perhaps be more similar, if not more adverse, than those prevalent in India. Other species from fear about the tropics may also be imported if their performances are reported to be better.

(3) Artificial insemination.- Attempts will be made to effect a cross between the foreign bee and the Indian bee under controlled conditions and evolve a better strain. Owing to the peculiar mating habits of the queen ordinary methods of crossing are not feasible. They have, therefore, to be restricted to artificial insemination, which is by itself a special art,

requiring high skill and competence.

C. Bee-appliances.-(1) The present type of bee-hive (Newton) in common use in South India is just enough to meet the breeding and honey gathering capacity of Apis indica. There is a possibility of improving the performance if they are accommodated in bigger hives. Apart from this, the evolution of a better type of bee either by selection or by crossing may automatically necessitate that of a bigger type of hive also. The designating of more efficient appliances to suit the needs would therefore, be one of the main items of research.

(2) Observations made so far show that individual colonies of Apis Indica refuse to increase beyond a certain limit, irrespective of the conditions and environments. Taking the populations of the hive as the 'index' of its future performance trials will be conducted to devise suitable technique and appliances which can effect and accommodate large population and probably having two or more queens in a hive. This method will be only tentative until the results of the hybridizing and selection work are available.

(3) Appliances for the easy transit and distribution of bee packages and queens will be devised.

(4) Minor appliances similar to the 'Porter' bee escape, the drone trap and the swarm trap may be modified and tried.

(5) Queen rearing.- Technique as well as appliances for rearing queens under the present economic possibilities of the Indian bee are available and the work may be pursued along with the advances in other directions.

D. Bee enemies and diseases.-(1) Enemies.- Enough knowledge has already been accumulated regarding the bee enemies occurring in this Presidency but a careful watch will be kept for the incidence of any new forms.

(2) Disease.- The Indian bee has so far been reputed to be free from any disease but complaints are occassionally received from Madras and a few other places wherein high death-rate of the brood as well as the young bees have been reported. Preliminary observations have gone to show that it is more due to the climatic factories than to any disease organism. The investigations may be continued.

E. Pasturage.- (1) A fairly exhaustive list of the pasturage plants of South India is available and the line of work will be continued with details regarding the month of flowering, the status etc.

(2) Studies made so far have shown that bee-pasturage is the deciding factor for the success or otherwise of bee-keeping. It was also found that the collection of the bee-foods are influenced by certain climatic and weather factors like temperature, humidity, high winds, success or failure of the monsoon, etc., and some interesting data have been gathered. A continuation of this line of work, especially on the influence of these factors on secretion of nector, will yield fruitful results.

(3) Determination of the actual quantities of pollen and nector collected by individual bees of different varieties from different crops would provide experimental data to correctly assess the working capacity of the bees and the status of the crops concerned.

(4) Pollen substitutes.- During periods of dearth of pasturage, bee colonies stop breeding and consequently go down in strength. Of the two, bee-foods, nectar deficiency can be augmented by feeding with sugar or jaggery syrup but all our previous attempts to induce them to take to artificial pollen substitutes have not been successful. The

European bee is reported to take a number of these substitutes. Any success achieved in this respect would go a long way to solve one of the major problems of bee-keeping in South India.

F. Bees and pollination.- The importance of bees in pollination can probably be better evaluated in the case of fruit crops. This may necessitate the stationing of an assistant in the fruit-growing areas of the Presidency, probably at the Fruit Research Station. Kodur, exclusively for the work. Details of the work will be furnished when the scheme is initiated.

G. Bee products.- The chemical and physical properties of honey from different sources have to be thoroughly investigated and standards of Indian honey - both Apis dorsata and Apis indica have to be fixed.

V. Venue of work.- (1) Coimbatore will be the centre of research and the headquarters of the officer-in-charge of the scheme. Important items of work such as crossing, breeding, selection, observations on the foreign bees, etc., as envisaged in the programme of work will be conducted here. He will be assisted by a staff of one assistant and one fieldman.

(2) Another assistant can be posted at Coonoor. A few colonies of the foreign bees and hill bees will be kept under observation there. The hives can be located at the Pomological station. Apart from general observations on the progress and habits of the bees, the importance of bees for pollinating exotic fruit trees will also be studied. He will have one fieldman to help him.

(3) One assistant can be posted at Kodur. He will maintain a dozen hives of Apis indica and study the influence of bees on the pollination and setting of Indian fruits. He will be helped by a fieldman.

(4) One Chemistry assistant can be entertained for a period of three years commencing from the third year of the inception of the scheme to study on the physical and chemical qualities of honey. He will work at Coimbatore and will be assisted by an attender.

VI. Staff.- (1) The scheme will run for a period of five years under the entire control and guidance of the Agricultural Entomologist, Coimbatore.

(2) Officer-in-charge.- An officer of the status of the Madras Agricultural Service will be in charge of the scheme. In view of the peculiar mating habit of the bee the possibilities of cross-breeding lie only in artificial insemination. This is a highly specialised art and the services of an officer of high competence and professional skill of a superior order are necessary. He should be a good Entomologist with sufficient experience in bee-keeping first and should also possess a fundamental knowledge of genetics and breeding technique. He should have a first-hand experience of the latest methods of bee-keeping, bee-breeding and artificial insemination in the Western countries. The post may, therefore, be advertised and a really capable hand recruited if necessary on a higher initial start.

(3) Subordinate staff.- Four assistants and four fieldmen as detailed below will be required for the scheme:-

Coimbatore--

(1) Officer-in-charge of the scheme
(2) One assistant
(3) One fieldman
(4) One Chemistry assistant for a period of three years from the third year of the scheme
(5) One attender
(6) One clerk

p.t.o

(7) One peon.

Coonoor -

(1) One assistant
(2) One fieldman

Kodur (1) One assistant
(2) One fieldman

Equipment:- The following are the equipment necessary by way of bee colonies, appliances, coolie, labour, etc.

The present stock of bee-colonies in working condition and the appliances with Department of Agriculture at Coimbatore and Coonoor can be conveniently transferred to the scheme.

The additional equipment would be as follows:--

One dozen foreign bee-colonies
Appliances for the same
Sheds at Kodur and Coonoor
One dozen hives for Kodur and appliances

VII. The financial implications are furnished below:-

Financial statement for the proposed bee-keeping scheme.

	First year	Second year	Third year	Fourth year	Fifth year.
Coimbatore--					
Officer-in-charge at Rs.230 in the scale of Rs.230-30/2-260-40/2-500-50/2-700 ..	2,760	2,760	3,120	3,120	3,600
One assistant on Rs.100 in the scale of Rs.100-5-140-10-220 ..	1,200	1,260	1,320	1,380	1,440
One fieldman on Rs.45 in the scale of Rs.45-2-55-1-60	540	564	588	612	636
One Chemistry assistant on Rs.100 in the scale of Rs.100-5-140-10-220 from the third year of the scheme	—	—	1,200	1,260	1,320
One laboratory attendant on Rs.19 in the scale of Rs.19-1-32 for the Chemistry assistant ..	—	—	228	240	252
One clerk on Rs.45 in the scale of 45-3-60-2-90	540	576	612	648	684
One peon on Rs.18-½-25	216	222	228	234	240
	5,256	5,382	7,296	7,494	8,172
					33,600

p.t.o.

Dearness allowance	First year	Second year	Third year	Fourth year	Fifth year
D.A. for officer-in-charge	552	552	624	624	708
" one assistant	288	312	324	336	348
" one Chemistry assistant	..	..	288	312	324
" ~~one field~~ fieldman	264	264	264	264	264
" for clerk	264	264	264	264	264
" ~~laboratory attendent~~	~~216~~	~~216~~	~~216~~	~~216~~	~~216~~
" laboratary attendent	..	..	216	216	228
" peon	216	216	216	216	216
	1,584	1,608	2,196	2,232	2,352
Dearness allowance at the rates sanctioned in G.O.No.99 Finance, dated 29th January 1948	..	..	..	..	9,972
Coonoor -					
One assistant on Rs.100 in the scale of Rs.100-5-140-220 ..	1,200	1,260	1,320	1,380	1,440
One fieldman on Rs.45 in the scale of Rs.45-2-55-1-60	540	564	588	612	636
	1,740	1,824	1,908	1,992	2,076
Dearness allowance for assistant	288	312	324	336	348
Dearness allowance for fieldman	264	264	264	264	264
	552	576	578	600	612
					2,928
Kodur -					
Details regarding staff same as Coonoor					
Total under pay of establishment for the five years	1,740	1,824	1,908	1,992	2,076
Total under dearness allowance of staff ..	552	576	578	600	612
Hill allowance for the staff at Coonoor --					
Hill allowance for assistant	270	270	270	270	270
Hill allowance for fieldman	162	162	162	162	162
	432	432	432	432	432
					2,160

Contingencies --	Rs.
Recurring--	
Coimbatore - two coolies at Rs.45 per month ..	1,080
" one boy at Rs.20 per month	240
Coonoor - one coolie at Rs.45 per month	540
Kodur - one coolie at Rs.45 per month ..	540
Other miscellaneous contingent expenditure, Coimbatore centre ..	1,000
Coonoor and Kodur each at Rs.400 ..	800
	4,200

p.t.o.

	Rs.
Non-recurring	
One dozen foreign bee-colonies	2,000
Appliances etc.	2,000
Shed at Kodur and Coonoor	400
One dozen hives for Kodur and other appliances	500
	4,900

Travelling allowance:-

At Rs.1,500/- per year for five years

Abstract of expenditure for the bee-keeping scheme for five years.

Non-recurring At Rs.4,900

Recurring--

Pay of establishment (including officer-in-charge)	52,680
Dearness allowance of establishment (including officer-in-charge)	15,828
Hill allowance for staff at Coonoor	2,160
Travelling allowance for entire staff	7,500
contingencies	21,000
	99,168 or 99,170 nearly

GOVERNMENT OF MADRAS
Food/ Department. /and Agriculture

Letter No.36667-K/49-2

From

To

The Secretary,
Indian Council of Agricultural Research,
New Delhi (with enclosure)

Dated Fort St. George the 6th December, 1949.

Sir,.

Sub: Agriculture - Indian Council of Agricultural Research - Revised scheme for the establishment of Central and Regional Bee-Research Stations - Printed copies - Forwarded.

Ref: Your letter No.F.8(4)/48-A.H.,dated 27-8-49

I am directed to forward herewith 200 printed copies of the scheme mentioned above.

Yours faithfully,

Sd/- . . . . **
Secy. to the Government

Copy to the Director of Agriculture with reference to his letter No.22803/49, dated 28-11-1949.

(True copies)

Superintendent,
Madras Record Office.

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